1	APPEARANCES:			
2	FOR	THE	GOVERNMENT:	OFFICE OF THE UNITED STATES ATTORNEY BY: MATTHEW J. ROSENBAUM
3				JULIA REESE ASSISTANT UNITED STATES ATTORNEYS
4				GENERAL CRIMES SECTION United States Courthouse
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7	FOR	THE	DEFENDANT:	FEDERAL PUBLIC DEFENDER'S OFFICE BY: GEORGINA WAKEFIELD
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1
          Los Angeles, California; Monday, March 25, 2019;
 2
                              2:59 p.m.
 3
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                          Item 5, CR-18-450-SVW, United States
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              THE CLERK:
 5
    of America versus Carlos Nava Cisneros.
 6
              Counsel, please state your appearances.
 7
              MR. ROSENBAUM: Good afternoon, Your Honor.
 8
    Matt Rosenbaum on behalf of the United States. To my left
 9
    is Assistant U.S. Attorney Julia Reese.
10
              MS. REESE: Good afternoon, Your Honor.
11
              MS. WAKEFIELD: Good afternoon, Your Honor.
12
    Georgina Wakefield and Gabriela Rivera on behalf of
13
    Carlos Nava Cisneros who is present on bond and using a
14
    Spanish-language interpreter.
15
              THE COURT: This is the time for evidentiary
16
    hearing on the motion to dismiss. In particular, the Court
17
    wanted to hear evidence regarding the issue of whether
18
    California law includes both geometric and optical isomers
19
    of methamphetamine because the federal law includes only
20
    optical isomers. And the Government has offered the
21
    testimony of a witness.
22
              Is there any expert testimony from the defense?
23
              MS. WAKEFIELD: No, Your Honor. We are requesting
24
    an opportunity to cross-examine.
25
              THE COURT: Yes, that's why I wanted to hold the
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5
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hearing because I did consider the declaration.
 1
              So is the witness here?
 2
 3
              MS. REESE: Yes, Your Honor, he is.
              THE COURT: Let's have him come forward, or she,
 4
 5
    whoever it is.
 6
              MS. REESE: It's a he, Your Honor. And if I may,
 7
    the Government is prepared to submit substantively on the
    declarations. However, the defense has raised Daubert and
 8
 9
    Rule 702 issues, and so if I may, I'd like to ask a few
10
    questions to that end either before Ms. Wakefield poses her
11
    questions or --
12
              THE COURT: You can do it before.
13
              THE CLERK: The witness will please step forward
14
    and stand behind the court reporter.
15
          ADAM LEE HALBERSTADT, GOVERNMENT'S WITNESS, SWORN
16
              THE CLERK: State your full name and spell it for
17
    the record.
18
              THE WITNESS: Adam Lee Halberstadt,
19
   H-a-l-b-e-r-s-t-a-d-t.
20
              Do you want me to spell my first name?
21
22
                         DIRECT EXAMINATION
   BY MS. REESE:
23
24
         Good afternoon, Professor Halberstadt. How are you?
25
         I'm good. Thank you.
```

- Q What do you do for a living?
- 2 | A I am an associate professor of psychiatry at the
- 3 | University of California San Diego.
- 4 | Q And what is the educational background that you have
- 5 | that qualifies you for that position?
- 6 A So I have a B.A. in Neurology, got that at the
- 7 | University of Delaware, and then I have a Ph.D. in
- 8 Neuroscience which was from the University of Pittsburgh,
- 9 | and I've also done a post-doctoral fellowship at University
- 10 of California San Diego in pharmacology.
- 11 | Q And when did you complete your Ph.D.?
- 12 | A It was in 2006.

- 13 | Q And how long have you been a professor?
- 14 A I started working as a faculty member in 2012, so I
- 15 | moved up to, first, as an assistant research scientist, and
- 16 | then I became an associate professor, and then last year I
- 17 | was promoted to associate professor.
- 18 Q And do you have any kind of specialty or area of focus
- 19 | that you work on?
- 20 A I focus on psychopharmacology, which is the study of
- 21 how chemical compounds affect the brain, interact with
- 22 receptors in the body. And medications. How it impacts the
- 23 | physiology of animals and humans.
- 24 | Q From your education and employment, have you become
- 25 | familiar with the substance methamphetamine?

A Yes, I have.

- 2 | Q And how have you become familiar with it?
- 3 A We work with methamphetamine in studies. We work with
- 4 other chemicals that have a similar structure. We publish
- 5 papers on methamphetamine and other compounds in the same
- 6 family of substances.
- 7 | Q When you say "we," do you mean you?
- 8 A Me and my colleagues, yes, other people that I work
- 9 with. So we publish papers together.
- 10 | Q So you've published papers relating to methamphetamine
- 11 | itself?
- 12 A Yes, I have.
- 13 | Q So from that work, have you become familiar with the
- 14 | chemical structure of methamphetamine?
- 15 | A Yes, I have.
- 16 Q Now, I want to ask you a few other questions about
- 17 other chemistry terms.
- First of all, though, do you have a background in
- 19 | chemistry?
- 20 A Yes. I've taken classes in chemistry when I was in
- 21 | college and also as a graduate student, and we work with a
- 22 | lot of different chemistry in our day-to-day experimental
- 23 | work. We also have a laboratory that's actually constructed
- 24 | just to make new chemicals that we use in our experiments,
- 25 | too. So we have a wet lab that works with chemistry in my

```
1
    space at UCSD.
         Now, based on your experience and your education, are
 2
 3
    you familiar with what a geometric isomer is?
 4
         Yes, I am.
 5
         What is it?
 6
   Α
         So a geometrical isomer is a type of isomer where you
 7
   have -- it has the same atoms and the same number as another
    compound that's -- that it would be a geometrical isomer of.
 8
    The atoms are arranged, bonded together in the same way, but
 9
    the three-dimensional structure is different.
10
11
              So they have the same atoms and the same
12
    connectivity, but there's difference in the
13
    three-dimensional spacial structure.
14
         Are you familiar with the term "diastereomer"?
    Q
15
         Yes, it's a synonym for a geometrical isomer.
         And what is -- if you were to give a definition
16
17
    chemically for what a diastereomer is, what would that
18
   definition be?
19
         Sure. So there's two different types of stereoisomers
20
    you can have. So as I said, these are compounds that
21
    have -- they have the same atoms and the same connectivity,
22
   but they have different spatial arrangement.
23
              And so there's two types of stereoisomers. One
24
    type is enantiomer which are compounds that are mirror
25
    images of one another. So they're isomers, but they're
```

```
mirror images, sort of how your hands have the same fingers,
 1
 2
    they're connected together in the same way, but they're not
 3
    spatially the same.
 4
              So one type of stereoisomer is an enantiomer.
 5
    second type of stereoisomer is a geometrical isomer. And
 6
    that is where the compounds are -- that is where the
 7
    compounds are -- sorry. I'm getting a little bit nervous.
 8
    That is where the compounds are -- sorry about that.
 9
         I can ask you another question.
10
         Can you ask me the question again. I'm sorry.
11
         I think you were talking a little bit there about
12
   stereoisomers, which I think is because I misspoke.
              So what is a diastereomer?
13
14
         So a diastereomer is a compound that is -- so it's a
    Α
15
    stereoisomer, but it's not a mirror image.
              So you have enantiomers which are stereoisomers
16
17
    which are mirror images, and then you have diastereomers or
18
    geometrical isomers which are stereoisomers which are not
19
   mirror images.
20
         Now, are you also familiar with the term
21
    "stereocenter"?
22
   Α
         Yes, I am.
23
         What is a stereocenter?
24
         A stereocenter is an atom in a molecule that's
25
   connected to other groups, usually three or more groups,
```

- 1 | where if you exchange any two of the groups, you will
- 2 produce a stereoisomer.
- 3 | Q And these definitions that we have just discussed, are
- 4 | those definitions generally agreed upon in your field and
- 5 | the field of chemistry, generally?
- 6 A Yes, they are. If you look at a textbook, you'll see
- 7 | those definitions.
- 8 Q So those definitions have been published in textbooks?
- 9 A They have, and in journal articles. Exactly.
- 10 | Q And does methamphetamine have any geometric isomers or
- 11 | diastereomers?
- 12 A No, it does not.
- 13 Q How do you know that?
- 14 | A Well, because of the definition of geometrical isomers.
- 15 | So enantiomers can occur in molecules that have only one
- 16 | stereocenter, but diastereomers or geometric isomers require
- 17 at least two stereocenters. So if you don't have two
- 18 | stereocenters in a molecule, it can't have geometrical
- 19 | isomers. It's just not possible based on a definition of a
- 20 | geometrical isomer.
- 21 Q So a geometrical isomer is the same thing as a
- 22 | diastereomer?
- 23 A They're synonyms, yes.
- 24 Q And in order for something to be diastereomer, is it
- 25 | your testimony that it must have at least two stereocenters?

```
At least two, yes.
 1
   Α
         So if something only has one stereocenter, then, it
 2
 3
    can't possibly be a diastereomer?
         Yes, exactly.
 5
         And what we've just discussed again, those definitions,
 6
   are those generally agreed upon in your field?
         Yes, those are the definitions that are used by
    chemists to refer to substances.
 9
         And I'd like to refer to a demonstrative. You'll see
10
    there's a stack of papers right up in front of you.
11
              Do you recognize those papers?
12
   Α
         Yeah, those are images that I've seen before, yes.
13
        Do you see your initials on them?
14
        Yes, I do.
   Α
         So you've reviewed these pages before your testimony
15
   today?
16
17
         I have.
18
         I'm going to put -- I may put this on the screen.
19
    will try very hard. Well, it looks like our auto focus is
20
   not working very well right now, so I will improvise.
21
              MS. REESE: Your Honor, do you have a copy of this
22
    for your reference? Just so that everyone's on the same
23
    page --
24
              And, Ms. Wakefield, I believe you have a copy,
25
    too.
```

```
1
              So there are page numbers in the bottom right-hand
 2
    corner. I will refer to those page numbers, then.
 3
              THE COURT: We should mark this as Court's
   Exhibit 1.
 4
 5
              MS. REESE: Yes, I will, Your Honor. And to that
 6
    end -- thank you for the reminder -- I'd offer it as well.
              THE COURT: It's received.
              (Court's Exhibit 1 received in evidence.)
 8
 9
   BY MS. REESE:
         And page 1 of the demonstrative, Court's Exhibit 1 that
10
11
    you have in front of you, what is shown there?
12
         This is a compound that has two stereocenters, and so
13
    if you look -- if you compare the compounds -- so it's the
14
    same compound, but these are geometrical isomers. So if you
15
    look at the two compounds, you'll see that the top
16
    stereocenter, so the one at the top -- this is a mirror
17
    image between the two compounds.
18
         Before you go on, let me ask you a question. There are
19
    some areas on here that are circled.
20
              What are those?
21
         Sorry, sorry, yes. The two areas that are circled on
22
   both of these compounds are the stereocenters.
23
         So what type of isomers are these?
   Q
         So these are geometrical isomers.
24
25
         These are geometrical isomers. So what's shown here on
```

- page 1 is not methamphetamine?
  No, it is not.
- 3 Q How do you know it's not methamphetamine?
- 4 A Just by looking at the structure.
- 5 Q And moving on to page 2, what have you circled there on
- 6 page 2 of Court's Exhibit 1?
- 7 A Those are the stereocenters.
- 8 Q What type of isomer is this?
- 9 A These are mirror images, and they are enantiomers.
- 10 | Q Are they also geometric isomers?
- 11 | A No, they are not.
- 12 Q Why not?
- 13 A Because they're mirror images, and so only enantiomers
- 14 | are mirror images.
- 15 | Q Page 3, what compound is shown on -- actually, let me
- 16 | start with page 4. What compound is shown on page 4 of
- 17 | Court's Exhibit 1?
- 18 | A So this would be methamphetamine.
- 19 Q And what have you circled on page 4 of Court's
- 20 Exhibit 1?
- 21 | A That is a stereocenter.
- 22 | Q How many stereocenters are there circled on page 4 of
- 23 | Court's Exhibit 1?
- 24 | A One single -- just one.
- 25 | Q What does that mean?

- 1 A That means that it cannot be a geometrical isomer or
- 2 | cannot have geometrical isomers. That it's an enantiomer.
- 3 | Q And going back to page 3 of Court's Exhibit 1, what is
- 4 | shown here?
- 5 | A So these are the two stereoisomers of methamphetamine.
- 6 | One of the stereoisomers is called dextro-methamphetamine,
- 7 | the other stereoisomer is called levo-methamphetamine.
- 8 | They're two enantiomers. And you can see that these are
- 9 | mirror images of one another.
- 10 | Q So methamphetamine has two enantiomers?
- 11 | A Yes.
- 12 Q But it has no geometric isomers?
- 13 A No, it does not.
- 14 | Q And no diastereomers?
- 15 | A No.
- 16 | Q And you can tell that because methamphetamine only has
- 17 one stereocenter?
- 18 A Yes, exactly.
- 19 MS. WAKEFIELD: Objection. Leading.
- 20 BY MS. REESE:
- 21 Q How can you tell that methamphetamine does not have any
- 22 | diastereomers or geometric isomers?
- 23 A So if you look at the structure, and you look at each
- 24 | atom in the structure, you can see whether it would be
- 25 | classified as a stereocenter. So you can look to see -- if

```
1
    you invert -- if you take the groups at each atom and you
 2
    change the orientation -- so the circled region here,
 3
    there's a methyl group attached to it.
 4
              THE COURT: Are you at page 3?
 5
              THE WITNESS: Yes. Yes, I am.
 6
              So on page 3, at the circled region, that's known
 7
    as the alpha carbon, that's positional name for that carbon,
    and it isn't shown in the diagram, but there's also a
 8
 9
    hydrogen attached to that alpha carbon. That's left out
10
    just by convention, but it's there implicitly. So you can
11
    see that there's a background, which is a chain. That's the
12
    lines that's are squiggly. That's what you call a backbone.
13
    That's sort of the core structure.
14
              And then you have at the bottom a methyl group
    projecting off, but the methyl group isn't really projecting
15
    down, it's down in the page. But in reality, this is a
16
17
    three-dimensional structure. And so the line that's dashed
18
    that denotes in three dimensions that the group is actually
19
    projecting down through the page.
20
              So it would be going this way. And there's an
21
    implicit hydrogen there which isn't shown just by convention
22
    and so it has to have the opposite orientation. So, in this
23
    case, the hydrogen would be pointing out of the plane of the
24
    page, perpendicular to the plane actually.
25
              So if you look across and if you actually took the
```

```
1
    hydrogen and the methyl group that are attached to that
 2
    alpha carbon and you foot them so that the methyl group was
 3
    pointing up out of the page and hydrogen was pointing down,
    those would be different isomers. They're stereoisomers
 4
 5
    because they have a different spatial orientation. So you
 6
    know that there's one stereocenter there.
              Then you can look at each of the different atoms
 8
    in methamphetamine to see whether something similar happens,
    and there's no where else in the molecule where that will
 9
10
    actually happen. So that's how you can tell that there's
11
    only one stereocenter in the methamphetamine molecule.
12
              You can examine the molecule and decide based on
    the definition whether there's other stereocenters. And
13
14
    just based on the definition, you can see that there's only
15
    a stereocenter in the molecule.
         And because there's only one stereocenter, what is your
16
17
    conclusion regarding whether there are diastereomers or
18
    geometric isomers of methamphetamine?
19
         That there cannot be geometrical isomers of
20
   methamphetamine.
21
              MS. REESE: Nothing further at this time,
   Your Honor.
22
23
              THE COURT: Cross-examination.
24
25
    ///
```

## 1 CROSS-EXAMINATION 2 BY MS. WAKEFIELD: 3 Good afternoon. Good afternoon. 4 5 Your declaration in this case, it identified two 6 optical isomers of methamphetamine; correct? Yes. And your declaration said that besides those two 8 9 optical isomers, no other isomers are possible; correct? 10 No other stereoisomers. Α 11 Okay. So there are stereoisomers? 12 There are. Those are the enantiomers that I -- they 13 were pictured in my declaration. It was shown on page 3, 14 the page marked 3 here. So those are stereoisomers of methamphetamine? 15 16 Yes. 17 Now, in preparation for your testimony, the Government 18 showed you an article that identified 1-phenyl-3-aminobutane 19 as a geometric isomer of methamphetamine; correct? 20 Α Yes. 21 MS. WAKEFIELD: Your Honor, I'd like to hand the 22 witness a copy of that article, and the Court as well. 23 And, Your Honor, I've marked this as Defense 24 Exhibit 103, and I'd move to admit it. 25 THE COURT: Let's call it Court's Exhibit 2.

```
1
              MS. WAKEFIELD: Okay.
 2
              THE COURT: It's received.
 3
              (Court's Exhibit 2 received in evidence.)
 4
              MS. WAKEFIELD: Thank you.
 5
    BY MS. WAKEFIELD:
 6
         This article was published in the Journal of Analytical
    Toxicology; correct?
 8
         Yes.
 9
         And it identifies at the last paragraph in the
10
    introduction -- let's call it the second paragraph in the
11
    introduction in parenthesis, it identifies
12
    1-phenyl-3-aminobutane (a geometric isomer of
13
   methamphetamine); correct?
14
         Yes, it says that.
   A
         Now, the Journal of Analytical Toxicology is a
15
   peer-reviewed journal?
16
17
         Yes, I believe it is.
18
         Now, in your preparation for your testimony, you told
19
    the Government that 1-phenyl-3-aminobutane is a structural
20
   isomer of methamphetamine; is that correct?
21
         I believe I said a constitutional isomer, but I'd have
22
   to look back over what we said in the conversation to be
23
   sure.
24
         Would it refresh your memory to take a look at the
25
   e-mail you sent to the Government?
```

```
1
   Α
         Sure.
 2
              MS. WAKEFIELD: Your Honor, may I approach?
 3
              THE COURT: Yes.
 4
   BY MS. WAKEFIELD:
 5
         And if you can read the third sentence to yourself and
 6
    let me know if that refreshes your memory.
         Yes.
 8
         So you called it a structural, and then in parens,
 9
    constitutional isomer; correct?
10
   Α
        Yes.
11
         Your opinion is that 1-Phenyl-3-aminobutane is an
12
    isomer of methamphetamine; correct?
13
   Α
         It is a type of isomer of methamphetamine, yes.
14
         Now, you're familiar with the Compendium of Chemical
    Terminology published by the International Union of Peer and
15
   Applied Chemistry; correct?
16
17
         I haven't examined the compendium. I've looked at the
18
    instructions they have online.
19
         That's called the "Gold Book"; right?
    Q
20
   A
        Yes.
21
         Now, the Gold Book is a publication for standardizing
22
   the nomenclature used in the field of chemistry; correct?
23
         Yes, exactly.
   Α
24
         Now, there is no entry in the Gold Book for the term
25
    "structural isomer"; correct?
```

```
I would have to look at it to see.
 1
   Α
 2
         Now, in the Gold Book, the term "geometrical isomer" is
 3
   considered obsolete; correct?
 4
        Yes.
   Α
 5
         It's use is discouraged; right?
 6
   Α
        Yes, it is.
 7
         Now, your testimony is that geometrical isomer is
   synonymous with diastereomer; correct?
 9
         Yes, people use -- some chemists use it the same way,
10
   yes.
11
         That's not how the Gold Book uses it; correct?
12
   Α
         It may not be.
13
         Would you like to take a look at it?
14
   Α
        Sure, yes.
15
              THE CLERK: Is there an exhibit number for the
16
   e-mail?
17
              MS. WAKEFIELD: Should we call it Court's
18
   Exhibit 3?
19
              THE COURT: Yes.
20
              (Court's Exhibit 3 received in evidence.)
21
              MS. WAKEFIELD: May I approach, Your Honor?
22
              THE COURT: Yes.
              MS. WAKEFIELD: We'll call this Court's Exhibit 4.
23
24
   BY MS. WAKEFIELD:
25
       Now, this is the entry in the Gold Back for geometrical
```

```
1
    isomerism; correct?
 2
         Yes, that is the entry.
 3
         And it says it's an obsolete synonym for cis-trans
   isomers; correct?
 5
   Α
        Yes.
 6
         It does not say it's a synonym for diastereoisomers;
   correct?
 8
         No, it does not say that.
 9
         In fact, the Gold Book defines diastereoisomers as
   stereoisomers, other than enantiomers; correct?
10
11
         Yes, I believe it does.
12
         So the Gold Book does not identify geometric isomers as
13
   a synonym for diastereoisomers; correct?
14
         It may not, no.
   Α
         Well, you have the definition in front of you. The
15
16
    Gold Book identifies it as an obsolete for synonym for
17
   cis-trans isomerism; correct?
18
         Yes, it says that here.
   Α
19
        Cis-trans isomers can be diastereoisomers; correct?
   Q
20
   A
        Yes, they're a subset.
21
         They're a subset. They're not terms that overlap
22
   completely; correct?
23
         It's a subset.
   A
24
         Diastereoisomers can also include other isomers;
25
    correct?
```

- 1 A It can include isomers that are not cis-trans isomers,
- 2 yes.
- 3 Q So it can include configurational isomers?
- 4 A No.
- 5 | Q So your testimony is that diastereoisomers cannot
- 6 | include configurational isomers; is that correct?
- 7 A You would have to define the term for me.
- 8 Q Can you define the term for us?
- 9 | A Well, there's not -- some terms don't have standardized
- 10 | definitions. That's the problem we're having with
- 11 diastereomer here and geometric isomer. It's an obsolete
- 12 | term, so it doesn't have a standard definition.
- 13 | Q So the term "geometrical isomer" doesn't have a
- 14 | standard definition; correct?
- 15 | A It's used multiple ways.
- 16 | Q And the term "diastereoisomers," that doesn't have a
- 17 | standard definition; correct?
- 18 A No, it does. That does.
- 19 Q Does the term "diastereoisomers" include
- 20 | configurational isomers?
- 21 A I'd have to see the definition of configerational
- 22 | isomers.
- 23 | Q And what definition would you need to use -- what
- 24 resource would you need to use?
- 25 A A book that defined it.

So you don't know from your training and experience a 1 Q standard definition for the term "configurational isomers"? 2 3 It has multiple definitions that I've seen used. How about the term "confirmational isomers"? 4 0 5 Α Confirmational isomers? Those are stereoisomers. 6 Q So they're a type of stereoisomer? 7 Yes. Α 8 Are they a type of diastereoisomer? 9 That, I'm not sure. Α What about epimers, e-p-i-m-e-r-s? 10 11 That's a type of enantiomer. Α 12 Is it a type of diastereoisomer? Q 13 Α I'm not sure. 14 Now, you testified that diastereoisomer are broader 15 than -- that term is broader than cis-trans isomers; 16 correct? 17 Α Yes. 18 So they're not synonymous; correct? 19 Well, they can be. Α 20 They can be, but they're not always? 21 Α Yes. 22 And, in your declaration, you did not identify that Q 23 they're not always synonymous; correct? 24 I'd have to look back over my declaration.

Now, I want to talk about methamphetamine,

- 1 | specifically. There are two electrons attached to the
- 2 | hydrogen atom in methamphetamine; correct?
- 3 | A Which hydrogen atom are you talking about?
- 4 Q Are there two electrons attached to any of the hydrogen
- 5 | atoms?
- 6 A When they bond, yes.
- 7 | Q Now, the electrons, they move quickly; right?
- 8 A Do you mean move around the nucleus?
- 9 Q Yes.
- 10 A Yes.
- 11 Q There could be a snapshot in time where the electron is
- 12 | switching place with the hydrogen atom; correct?
- 13 | A Can you rephrase that, please.
- 14 Q There can be a snapshot in time when the electron is
- 15 | moving and switching place with the hydrogen?
- 16 | A You mean it's moving from one atom to another?
- 17 | Q Yes.
- 18 A The electrons do -- when there's bonding, electrons are
- 19 | transferred from one atom to another.
- 20 Q So that snapshot, when it's transferring, that would
- 21 | not be a perfect mirror image; correct?
- 22 A I'm not sure I follow what you mean.
- 23 | Q If there's a snapshot in time when the electron is
- 24 | switching place, there would be a snapshot in time where the
- 25 | molecule was not a perfect mirror; correct?

A The mirror of what?

- 2 | Q Where it's not an optical isomer; correct?
- 3 A Are you asking me if the isomers can sometimes -- the
- 4 optical isomers are sometimes optical isomers?
- 5 | Q When the electrons is switching place, yes.
- 6 A So when bonding occurs between atoms, they exchange
- 7 | electrons, but it doesn't change the structure of the
- 8 | molecule. The structure is fixed, unless it's changed by
- 9 | some other force or it happens spontaneously.
- 10 | Q I want to talk about your background. You, in
- 11 | preparing for today's hearing, you told the Government you
- 12 | are not an expert in California's definition of
- 13 | methamphetamine; correct?
- 14 A No, I'm not an expert in the definition according to
- 15 | the Controlled Substance Act in California, no.
- 16 | Q You haven't reviewed any legislative history; correct?
- 17 | A No, I haven't.
- 18 | Q You don't know how the legislature came to define
- 19 | methamphetamine?
- 20 | A No, I don't.
- 21 | Q You don't know how the legislature came to define
- 22 | geometric isomers?
- 23 | A No, I don't.
- 24 | Q In fact, you testified that that term can have
- 25 | different meanings; correct?

- 1 A Yes.
- 2 | Q And you don't know how the legislature came to define
- 3 | diastereomeric isomers; correct?
- 4 | A I don't analyze legislative history, no.
- 5 | Q You don't know whether the legislature heard scientific
- 6 | testimony?
- 7 | A No.
- 8 | Q You don't know whether the legislature considered
- 9 | scientific articles?
- 10 A No.
- 11 | Q Your Ph.D. is in neurobiology; correct?
- 12 | A Yes.
- 13 | Q You testified you have a bachelor of arts degree in
- 14 | Biological Sciences and Psychology; correct?
- 15 | A Yes, it was a combined program that gives you a -- it's
- 16 | a neuroscience program with degrees that you come out are in
- 17 | biology and psychology.
- 18 | Q You don't have any degrees in chemistry?
- 19 A No, I do not.
- 20 Q Your research focuses on the effects of drugs on the
- 21 brain?
- 22 | A Yes.
- 23 Q Specifically, you have studied the effects of
- 24 | hallucinogens on the brain?
- 25 | A That's one type of product that we worked on, yes.

- 1 Q Your articles that you've published have focused on the
- 2 effects of hallucinogens on the brain?
- 3 A Some of them have.
- 4 | Q Methamphetamine is not a hallucinogen; correct?
- 5 | A No, but we've published articles on methamphetamine.
- 6 Q You personally have not authored any articles on
- 7 | methamphetamine?
- 8 A That's not true.
- 9 Q You spoke with the Government in December of 2018;
- 10 | correct?
- 11 A Yes.
- 12 Q And when you spoke with them, you told them you had not
- 13 | authored any articles on methamphetamine?
- 14 A Yes, that was not -- that was a mistake.
- 15 | Q So when you told the Government that in December, that
- 16 | was a mistake?
- 17 A Yes.
- 18 Q And you told them you had not published any research on
- 19 | methamphetamine; correct?
- 20 A Yes.
- 21 | Q And you told them you hadn't worked with
- 22 | L-methamphetamine at all; correct?
- 23 A Yes.
- 24 Q Now, you work in the Department of Psychiatry at the
- 25 | University of California at San Diego; correct?

- A Yes, I do.
- 2 | Q Your job title is associate adjunct professor; correct?
- 3 A Yes.

- 4 | Q And your job title before that was assistant adjunct
- 5 professor; correct?
- 6 A Yes.
- 7 | Q There is a difference between an adjunct professor and
- 8 | a professor who is not an adjunct professor; correct?
- 9 A You want me to explain the difference at UCSD?
- 10 | Q Sure.
- 11 A So at UCSD, adjunct titles are there because the
- 12 | university doesn't pay our salary, so we have to pay our
- 13 | salary based on bringing in grant money. So the adjunct
- 14 | title is an internal title that just denotes where our
- 15 | salary is paid from, where the funds come from.
- There are some people that work at UCSD that are
- 17 | paid directly by the university and at least for their
- 18 | salary don't have to get grant money. But in my series, I
- 19 | have to get money from my research separate from the money
- 20 | that comes from the university, so that's why I'm considered
- 21 | an adjunct associate professor.
- 22 | Q Now, an associate adjunct professor does not have
- 23 | tenure; correct?
- 24 A No.
- 25 | Q An associate professor does have tenure; correct?

```
1
   Α
         Yes.
 2
         So there's a difference between an associate adjunct
 3
   professor and an associate professor; correct?
 4
         In terms of the -- in terms of the internal job
 5
    description at UCSD, yes.
 6
    Q
         And in terms of the pay; correct?
 7
    Α
         No.
 8
         In terms of whether the pay comes from the university
 9
    or from an outside source; correct?
10
         Well, all the money goes to UCSD first, so it doesn't
11
    change how the job operates day-to-day, it just changes
12
    where UCSD gets the money from to pay you.
13
         And there's a difference between the tenure; correct?
14
         Theoretically. It doesn't -- there's no -- there's no
    Α
15
    real job security for most people in the department.
         But an associate professor has tenure; correct?
16
17
         That's my understanding, yes.
18
         An associate adjunct professor does not; correct?
19
         That's my understanding.
   Α
20
              MS. WAKEFIELD: One moment, please, Your Honor.
21
              Nothing further. Thank you, Your Honor.
22
              THE COURT: Any further questions from the
23
    Government?
24
              MS. REESE: Yes, Your Honor, may I?
25
              May I approach the witness and the bench,
```

```
Your Honor, with terms to reference?
 1
 2
 3
                        REDIRECT EXAMINATION
 4
   BY MS. REESE:
 5
         Professor Halberstadt, you were asked some questions
 6
    regarding the article by Gilbert by Ms. Wakefield.
 7
              Do you remember those questions?
 8
         Yes, I do.
   Α
 9
         And I've handed up to you an article by -- sorry. You
    were asked -- the questions you were asked didn't relate to
10
11
    the article by Gilbert, I suppose. It related to the
12
    article by Branum.
13
              I've handed you an article by an individual named
14
    Richard Gilbert, and I suppose --
15
              MR. REESE: Could we mark this Court's Exhibit 4?
              THE CLERK: Five.
16
17
              MS. REESE: Court's Exhibit 5.
18
              And may I offer it into evidence, Your Honor?
19
              THE COURT: Yes, it's received.
20
              (Court's Exhibit 5 received in evidence.)
21
   BY MS. REESE:
22
         And on page -- what is numbered as page 85, the second
23
    page of the article that I've shown you, does that contain a
24
    diagram of the 1-phenyl-3-aminobutane structure that was
25
    referenced in the Branum article?
```

Yes, it does. They labeled it differently, but it's 1 Α 2 the same compound, and that is Compound B in Figure 1. 3 So Compound B in Figure 1 is the same 1-phenyl-3-aminobutane compound that is referenced in the 5 Branum article? 6 Α Yes, it is. Looking at Compound B in the Gilbert article, is that methamphetamine? 9 No, it's not. Α 10 How do you know? 11 Because methamphetamine is Molecule D in that figure. 12 So what about Molecule B in this figure tells you that 13 it is not methamphetamine? 14 It has a completely different structure. It contains 15 all the same -- it contains all the same atoms, so it's a 16 constitutional isomer, but if you look at the arrangement of 17 the atoms, so if you compare B and D, the arrangement is 18 competely different. 19 So in B, there's a ring structure, benzium ring, 20 and then there's -- you count them one, two, three carbon 21 atoms in the chain; and then at the end there's an amino 22 group, that's the nitrogen, the nh2. So if you look at 23 Molecule D, methamphetamine, there's a ring structure. 24 That's a benzium ring, and then you can see there's two

carbons, and then an amino group.

```
1
              So Compound B has a ring, and then three carbons
 2
    and an amino group, while Compound D, methamphetamine, has a
 3
    ring, and two carbons and an amino group. That's not the
 4
    same structure.
 5
         Does the Branum article's reference to "geometric
 6
    isomers of methamphetamine" change your conclusion about
    whether such isomers actually exist?
         No, it does not.
 8
         Are you aware of any other scientific articles that
 9
10
    reference geometric isomers of methamphetamine?
11
         I've never seen any other articles, no.
12
         And you were also asked some questions about the Gold
13
   Book's definition of geometric isomerism.
14
   Α
         Yes.
        And about cis-trans isomerism?
15
16
   Α
         Yes.
17
        What are cis-trans isomers?
18
         Cis-trans isomers are a subset of geometric isomers.
   Α
19
    So they still fall in the definition of a geometric isomer,
20
    but they are a subset because they deal with compounds that
21
    specifically have rigid carbon-carbon bond. So most
22
    carbon-carbon bonds -- single bonds will rotate, but
23
    carbon-carbon bonds can also be rigid, either because
24
    they're held in place by a double bond or because they're
25
    part of a ring structure.
```

```
1
              And so if you have a rigid carbon-carbon bond, and
 2
    then there's two functional groups attached to carbons that
 3
    make up the bond with one located on one end of the
 4
    carbon-carbon bond and the other functional group on the
 5
    other, that produces a situation where you can have
 6
    cis-trans isomers, so it's a subset of geometric isomers.
 7
    So not all geometric isomers are cis-trans isomers -- sorry.
 8
    Yes, not all geometrical isomers are cis-trans isomers, but
 9
    all cis-trans isomers are geometric isomers.
10
         Do cis-trans isomers of methamphetamine exist?
         So, it would require you having a rigid carbon-carbon
11
12
   bond with a functional group on either end. If you look at
13
    the structure of methamphetamine, if you look at each atom,
14
    you don't see a situation where that occurs.
15
         Have you prepared a declaration regarding whether
    cis-trans isomers of methamphetamine exist?
16
         Yes, there is one in another case.
17
18
         And do you have that up there with you?
19
         Yes. Yes, I do.
   Α
20
         Do you recognize that declaration?
21
   Α
         Yes, I do.
22
   Q
         Is that your signature on the bottom?
23
         It is.
   Α
24
         Do you adopt that declaration?
25
         Yes, I do.
```

```
1
              MS. REESE: Your Honor, the Government offers this
    as Court's Exhibit 6.
 2
 3
              THE COURT: Received.
              (Court's Exhibit 6 received in evidence.)
 4
 5
              MS. REESE: Nothing further, Your Honor.
 6
              THE COURT: Do you wish to inquire further?
 7
 8
                         RECROSS-EXAMINATION
 9
   BY MS. WAKEFIELD:
         Professor Halberstadt, your testimony is that cis-trans
10
    isomers are a subset of geometric isomers?
11
12
   Α
         Yes.
13
        And that definition that you're using, that's
    inconsistent with the Gold Book; correct?
14
15
         Well, the Gold Book -- so it's an obsolete term, so
    they don't give a comprehensive definition of geometric
16
17
    isomers. They just give the most common definition.
18
         And they say it's an obsolete term used as a synonym
19
    for cis-trans isomers; correct?
20
         Yes, but it's also used as a synonym for other types of
21
    isomers, yes, other types of diastereomers.
22
         Fair to say that all of these terms are used
   Q
23
    differently in different contexts?
24
         The term "geometric isomer" has been used in two
25
    different ways, yes.
```

- Q And it's the same with cis-trans isomers; correct?
- 2 | A A cis-trans isomer has a specific definition.
- 3 | Q But the Gold Book defines geometric isomers as a
- 4 | synonym of cis-trans isomers; correct?
- 5 A Yes, that's how they define it, yes.
- 6 Q But you have a different definition?
- 7 | A No, I'm just -- I'm just explaining how the term is
- 8 used in the literature.
- 9 Q The literature, besides the Gold Book; correct?
- 10 A Yes, the Gold Book is only a recommendation for how
- 11 | chemists should name compounds, and they're not even
- 12 recommending a specific term for this. They're just
- 13 explaining one way that it's been used.
- 14 Q So the Gold Book is the standardly accepted textbook on
- 15 | naming chemical terms; correct?
- 16 A It's a formalization of rules that chemists have
- 17 developed to name compounds.
- 18 | Q It's generally accepted within the field of chemistry;
- 19 | correct?

- 20 A It isn't used in every purpose in journal articles,
- 21 | it's a recommendation for how to name things formally.
- 22 | Q And the recommendation for geometric isomers is from
- 23 | 1996; correct?
- 24 | A I wouldn't view this as a recommendation, I would view
- 25 | it as an explanation.

```
1
              MS. WAKEFIELD: One moment, Your Honor.
 2
   BY MS. WAKEFIELD:
 3
         Do you have the Gold Book of geometric isomerism in
    front of you?
 5
   Α
         Yes, I do.
 6
         Do you see under the word "source"?
 7
   Α
         Yes.
 8
        And you see it cites to the recommendations of 1996?
 9
   Α
         Yes.
         So the source for this definition is from the
10
11
   International Union of Peer and Applied Chemistry, their
12
   recommendations that they issued in 1996; correct?
13
         Yeah, but they're recommending that the term not be
14
   used.
15
         They're recommending that the term not be used and it
   be defined as an obsolete synonym for cis-trans isomerism;
16
17
   correct?
18
         Yes, that's how they're explaining it.
19
              MS. WAKEFIELD: One moment, please.
20
              Nothing further. Thank you, Your Honor.
21
              THE COURT: The parties have a few minutes to sum
22
    up, and then I'll take the matter under submission. Do you
23
    want to give me your sum-up position.
24
              MR. ROSENBAUM: Your Honor, there's a second
25
    witness available. The immigration officer who was
```

1 present --2 THE COURT: This is the only issue that I need 3 testimony about. So let me hear your sum up on this witness 4 briefly. 5 MS. REESE: Your Honor, would you like the witness 6 excused at this point? THE COURT: He can sit there. You don't have to go through all his testimony. Just give me the essence of 8 9 what you think is most persuasive. 10 MS. REESE: Your Honor, clearly the parties are in 11 agreement about at least one thing or at least there's no 12 factual dispute about at least one thing, which is that 13 geometric isomers can mean diasteromer, and it can also mean 14 cis-trans isomer. And cis-trans isomers are a subset of 15 diastereomers. 16 And what there again has been absolutely no 17 dispute about is whether either diastereomers or cis-trans 18 isomers of methamphetamine exist. Neither diastereomers, 19 nor cis-trans isomers of methamphetamine exist. That was 20 Professor Halberstadt's testimony and that is the undisputed 21 evidentiary record upon which this Court must make its determination in this case. 22 23 And given that neither diastereomers of 24 methamphetamine nor cis-trans isomers of methamphetamine

exist, and there's no alternative conception for what a

25

```
1
    geometric isomer could have meant -- what California could
 2
    have meant by a geometric isomer, under those circumstances,
 3
    then the conclusion that geometric isomers of
    methamphetamine don't exist is self-evident.
 4
 5
              And if I may have one moment, Your Honor, I'd like
 6
    to grab the California statute that is actually at issue
 7
    here. And actually it may be useful. I can hand this
    version to the Court for the Court's reference if you'd
 8
 9
    like.
10
              THE COURT: All right.
11
              MS. REESE: So California Health and Safety Code
12
    Section 11033 which is where the definition of "isomer" that
13
    we're disputing about with respect to methamphetamine, where
14
    it comes from, and I will note that it defines "isomer"
15
    generally and broadly for use through the entire California
    Health and Safety Code. And its definition of geometric
16
17
    isomer notes parenthetically diastereomers, and so there was
18
    a lot of discussion during cross-examination about the
19
    Gold Book's definition of geometric isomer.
20
              What matters here is how California has defined a
21
    geometric isomer, and the parenthetical note in California
22
    Health and Safety Code Section 11033 does appear to limit
23
    the definition to diastereomers and diastereomeric isomers.
24
    And given that limitation, Professor Halberstadt's
25
    undisputed testimony that diastereomers of methamphetamine
```

```
1
    do not exist conforms to the way that California itself has
 2
    defined geometric isomer, but either way, whether it's the
 3
    Gold Book definition, which is focused on cis-trans isomers
 4
    or the definition that appears to be apparent from the face
 5
    of California Health and Safety Code Section 11033, neither
 6
    diastereomers nor cis-trans isomers of methamphetamine
 7
    exist.
 8
              There are only two possible isomers of
 9
    methamphetamine, and they are L-meth and D-meth which are
    enantiomers of each other. And under those circumstances, I
10
11
    don't think that there is any reasonable factual dispute
12
    about whether geometric isomers of methamphetamine exist.
13
              THE COURT: All right. Let me hear from
14
    defendant. Give me a sum up if you can.
15
              MS. WAKEFIELD: Thank you, Your Honor.
              I think it's clear that these terms do not have
16
17
    precise meanings, that they're used differently, and they're
18
    given different definitions in different contexts.
19
              I think the California Health and Safety Code
    11033, it is -- it defines "isomers" in an inclusive and
20
21
    broad way, and it notes that the term "isomer" includes
22
    optical and geometrical, and then in parens diastereomeric
23
    isomers. When we contrast that with the federal definition
24
    of isomer that's applicable here, it's a very limited
```

definition. It says the term "isomer" means the optical

25

isomer.

So the California definition is broad, and it's meant to be inclusive, whereas, the federal definition is narrow and meant to be limited just to optical isomers. So when we have these different terms used differently in different contexts, we have a treatise used in the field of chemistry that defines these terms one way, we have testimony that defines these terms a different way, I think the California statute is meant to be broad and encompass all of these different definitions, and it's meant to be inclusive in these cases.

And so I don't think the precise question that's relevant here is whether the term of "geometrical isomers" as defined by the professor includes methamphetamine. The question is really whether California's law definition, broad definition, includes methamphetamine. And I think there, given the different definitions and different contexts and the broad terms used by the California legislature, I think that's enough.

And I did also want to address the legal -- some of the legal arguments. I don't know if the Court wants us to do that now.

THE COURT: No, I'm mostly interested in this.

The other arguments I can grasp from the pleadings.

MS. WAKEFIELD: Thank you, Your Honor. One thing

```
I wanted to address is I don't think that the Court's
 1
 2
    analysis should get to this question because of the cases
 3
    that we cited about when the overbreadth is apparent from
    the face of the statute, that the defendant has carried his
 5
    burden. And that's the Dow {sic} decision en banc of the
 6
    Ninth Circuit. And so I wanted to make that point as well
    for the Court.
 8
              THE COURT: Thank you. The matter will stand
 9
    submitted. Thank you, Doctor.
10
              MR. ROSENBAUM: Just for the record, just a few
11
   notes. I believe the defense has requested an opportunity
12
    to cross-examine the law enforcement officer. He's driven
13
    multiple hours to be here, so to the extent the Court wants
    to hear from him --
14
15
              THE COURT: I didn't find it necessary to hear
    from him.
16
17
              MR. ROSENBAUM: Understood. And then just a
18
    housekeeping matter, I think we're currently set for trial
19
    in mid April, and I believe both parties would --
20
              THE COURT: I'll issue an order.
21
              MR. ROSENBAUM: Okay. We can also file a
22
    stipulation if Your Honor would like.
23
          (Thereupon, at 4:08 p.m., proceedings adjourned.)
24
25
                                -000-
```

```
1
 2
 3
                             CERTIFICATE
 4
 5
              I hereby certify that pursuant to Section 753,
    Title 28, United States Code, the foregoing is a true and
 6
    correct transcript of the stenographically reported
 8
    proceedings held in the above-entitled matter and that the
 9
    transcript format is in conformance with the regulations of
10
    the Judicial Conference of the United States.
11
12
    Date: April 4, 2019
13
14
                                    /s/ Lisa M. Gonzalez
15
                           Lisa M. Gonzalez, U.S. Court Reporter
                           CSR No. 5920
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BY MS. REESE: [4] 12/8	20 [1] 3/17	according [1] 25/14
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BY MS. WAKEFIELD: [5]		Act [1] 25/15
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MR. ROSENBAUM: [2]	2019 [3] 1/16 4/1 42/12	15/18 15/24 15/25 16/10
4/6 41/20	213 [1] 1/23	32/7 38/6 38/7
MS. REESE: [9] 4/9 5/2	213.894.2854 [1] 2/10	Adam [3] 3/4 5/15 5/18
5/5 12/4 16/20 29/23 30/16	213.894.4896 [1] 2/6	address [2] 40/20 41/1
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MS. WAKEFIELD: [12]	28 [1] 42/6	adjunct [10] 28/2 28/4 28/7
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THE CLERK: [5] 4/3 5/12	3	adopt [1] 33/24
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THE COURT: [24] 4/14	312 [1] 2/5	afternoon [6] 4/7 4/10 4/11
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1-phenyl-3-aminobutane [6]	894-2979 [1] 1/23	AMERICA [2] 1/6 4/5
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12 [1] 3/15	about [20] 7/16 9/8 9/11	31/4
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1996 [3] 35/23 36/8 36/12	38/18 39/12 41/3	Angeles [5] 1/15 1/23 2/5
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